Watermarked image, $I'(x, y)$

Message, $M(x, y)$

BINARY   ICONIC

Kodak

or

100101

Key

Carrier, $C(x, y)$

Convolve

$M(x, y) * C(x, y)$

α → Scale to small amplitude

Original image, $I(x, y)$

Fig. 1
(Prior Art)

AVG

Sum of sections

Key

Carrier, $C(x, y)$

Correlate

BINARY   ICONIC

Kodak

Display

or

100101

Extracted message, $M'(x, y)$

Watermarked image, $I'(x, y)$

Fig. 2
(Prior Art)

Location of first tile in
consecutive frames

Tile 1		

Frame *n*-1

	Tile 1		

Frame *n*

	Tile 1		

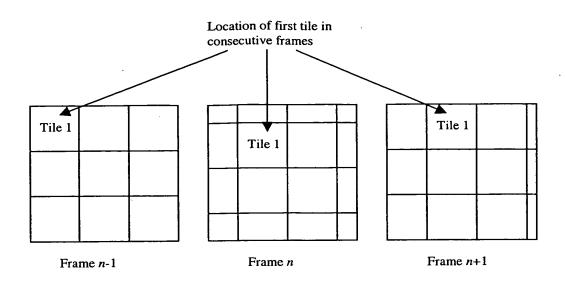Frame *n*+1

FiG. 3

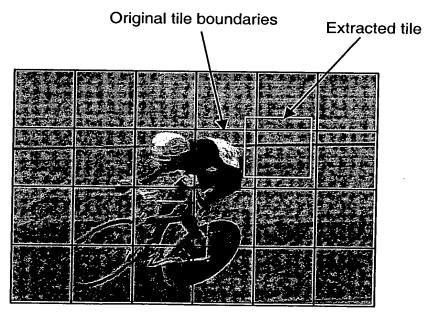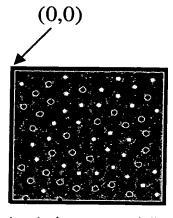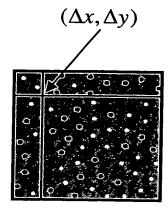Original tile boundaries   Extracted tile

FiG. 4

(0,0)

(Δx, Δy)

Extracted message (aligned)

Extracted message (shifted)

FiG. 5

Message template, $T(x, y)$

40

Magnitude of extracted
message (shifted),
$|M'(x \neq \Delta x, y \neq \Delta y)|$

42

~~Circular~~
~~Cyclic~~
Correlator

44

Correlagram

46

Find
peak and
compute
shift
(Δx, Δy)

48

Align the
extracted
message

50

Extracted message
(aligned), $M'(x, y)$

FiG. 6